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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,511	10/28/2003	John C. McCarthy	D-2003-0004	5433
7590 03/01/2005 Robert K. Tendler 65 Atlantic Avenue Boston, MA 02110			EXAMINER MENEFEE, JAMES A	
			ART UNIT 2828	PAPER NUMBER

DATE MAILED: 03/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary

Application No.

10/695,511

Applicant(s)

MCCARTHY ET AL.

Examiner

James A. Menefee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION***Specification***

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: There is no disclosure in the specification of the limitations of claim 10, i.e. the laser operating in the 3 micron band. This should be added to the specification. Note that since this is an original claim, there will be no new matter problem with adding this information to the specification.

Claim Objections

Claim 10 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claim 10 requires the laser to operate in the 3 micron band. However, parent claim 9 requires the laser to operate in the 1.5 micron band. Therefore claim 10 does not properly limit claim 9, since claim 10 could be infringed without infringing parent claim 9. See MPEP 608.01(n) III.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Specifically, the problem would be remedied if the claim were dependent on claim 8, rather than on claim 9.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 8-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 8, the claim specifies that "said laser is an eyesafe laser." However, it is not clear which laser is supposed to be eyesafe. Is it the pump laser, the ring laser, or the output of the whole system? It is believed that the entire output, i.e. the output from the OPA, is intended to be eyesafe, but this must be clarified in the claim.

Regarding claim 9, the claim recites "said eyesafe laser," but there is no antecedent basis for this limitation. It is believed the claim should depend from claim 8 rather than claim 1.

Claim 10 is rejected as depending from claim 9 and including this problem.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-18 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9, 11-15, and 17-19 of

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compending Application No. 10/424,300 in view of Komine (US 5,400,173) and further in view of Telfair et al. (US 2002/0133146).

Regarding claim 1, '300 claims an apparatus comprising a pump laser having an output beam along a single beam line, an OPO having a nonlinear optical crystal located along said single beam line, and an OPA that accepts the output of the OPO and also having a nonlinear crystal located along said single beam line. It is not claimed that the OPO is a ring laser. Komine teaches in Figs. 1 and 4 an OPO 12 that is configured as a ring. Komine does not teach any reasons for making the OPO as a ring. However, Telfair teaches that an OPO may be in a ring configuration. See pars. [0039] – [0040]. Telfair further provides motivation for making this modification in par. [0039]. It would have been obvious to one skilled in the art to make the OPO as a ring in order to prevent problems of feedback back to the pump, as taught by Telfair.

Regarding claim 2, Komine's ring OPO has mirrors angled at 45°.

Regarding claim 3, Komine's ring has an input mirror (upper mirror 17 of Fig. 4) to one side of the nonlinear crystal, and an output mirror 19 or 20 to the other side.

Regarding claim 4, the reflectors of Komine may be dichroic.

Regarding claims 5-6, Komine's OPO has pump (wave 0), signal (wave 1), and idler (wave 2). The input mirror is highly transmissive of the pump and reflective of the signal, and the output mirror is transmissive of the pump and idler and reflective of the signal. See discussion of Fig. 4 on col. 7.

Regarding claim 7, '300 claims the crystals as KTP.

Regarding claim 8, '300 claims the laser is eyesafe.

Regarding claim 9, '300 claims the output as 1.5 microns.

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Regarding claim 10, '300 does not claim the output is 3 microns. But such an output is dependent on the pump input and the particular crystals used; it would have been obvious to one skilled in the art to use particular pumps by engineering design choice to achieve this desired result for an intended use of the laser.

Regarding claims 11-13, these method steps are taught as in the rejections above regarding the apparatus. '300 also claims the pump source is Nd:YAG, which is monochromatic.

Regarding claims 14-15, Komine's system teaches the limitations, see rejection of claims 5-6 above.

Regarding claims 16-18, the method steps are taught as in the rejections above. While not specified as "for minimizing the weight and size of a LIDAR unit," this preamble limitation only denotes the intended use of the method and is not given patentable weight.

This is a provisional obviousness-type double patenting rejection because '300 has not been patented. See US 2004/0012841. Note however that '300 has been allowed, and the claims from this published application have been amended.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 11-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Komine (US 5,400,173).

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Regarding claim 11, Komine discloses in Figs. 1 and 4 a method in a laser system that includes a pump laser 11 and an OPO 12, comprising steps of providing the OPO in the form of a ring laser having a segment including a nonlinear crystal 18 having an optical axis, and injecting a beam of monochromatic light (because pump source 11, being Nd:YLF/YAG, will be monochromatic) from the pump laser along a path aligned with the optical axis of the nonlinear crystal. While not specifically recited as “for eliminating feedback,” Komine’s system will necessarily eliminate feedback due to its ring configuration.

Regarding claim 12, the ring laser comprises mirrors 17,19,20 which are at an angle to the optical axis of the nonlinear crystal 18, whereby light traveling around the ring is reflected in a direction away from the pump laser, thus eliminating feedback.

Regarding claim 13, as seen in Fig. 4 the angle must be 45°.

Regarding claim 14, the ring laser generates a signal (wave 1, col. 6 line 44), the mirrors include an input mirror (upper 17 in Fig. 4) on one side and an output mirror 19 to the other side of the nonlinear crystal, wherein the input mirror is reflective of the signal. Col. 7 lines 32-33.

Regarding claim 15, the input mirror is transmissive of the pump laser (wave 0, col. 6 line 43, col. 7 line 38-39), the ring laser generates an idler (wave 2, col. 6 line 44), the output mirror being transmissive of the pump and idler and reflective of the signal. Col. 7 lines 32-40.

Regarding claims 16-18, the limitations are disclosed as noted above. No isolators are needed to prevent feedback due to the ring configuration. While Komine does not disclose that this is “for minimizing weight and size of a LIDAR unit,” this preamble limitation only denotes the intended use of the device and is not given patentable weight.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komine. See Figs. 1 and 4 and the discussion thereof.

Regarding claim 1, Komine discloses an apparatus comprising a pump laser 11 having an output beam defining a single beam line, an OPO 12 in the form of a ring laser having a nonlinear optical crystal 18 aligned along said single beam line, and an OPA 13 (because an OPO is defined as an OPA with resonator mirrors, therefore OPO 13 necessarily includes an OPA) positioned to accept the output of said OPO and having a nonlinear crystal 42. Komine appears to disclose the elements 11, 12, and 13 all along a single beam line. See Fig. 1. However, since the ring configuration is being used, the output of the ring configuration goes perpendicular to the pump beam, therefore the OPA would not be aligned along the single beam line. However, there appears to be no reason for the output to go in this direction, and it would not appear to change the operation of the device to switch the mirrors 19 and 20 of Komine. Since the operation of the device would not change, other than the direction of the output, it would have been obvious to one skilled in the art to flip the mirrors 19 and 20, thereby placing all the elements along a single beam line. It has been held that a mere rearrangement of parts without changing the operation of the device is obvious. *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950); *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975).

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Regarding claim 2, the ring laser comprises mirrors 17,19,20 which are at an angle to the beam line. As seen in Fig. 4 the angle must be 45°.

Regarding claim 3, the mirrors include an input mirror (upper 17) to one side and an output 20 to the other side of the nonlinear crystal.

Regarding claim 4, the mirrors of Komine can be dichroic.

Regarding claim 5, the input mirror is transmissive of the pump laser (wave 0, col. 6 line 43, col. 7 line 38-39), the ring laser generates a signal (wave 1, col. 6 line 44), and the input mirror is reflective of the signal. Col. 7 lines 32-33.

Regarding claim 6, the ring laser generates an idler (wave 2, col. 6 line 44), the output mirror being transmissive of the pump and idler and reflective of the signal. Col. 7 lines 32-40.

Regarding claim 7, the nonlinear crystals are KTP.

Regarding claims 8-9, Komine does not claim the output is eyesafe or 3 microns. But such an output is dependent on the pump input and the particular crystals used; it would have been obvious to one skilled in the art to use particular pumps by engineering design choice to achieve this desired result for an intended use of the laser.

Regarding claim 10, the laser operates around 3 microns. See Fig. 2.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Merriam et al. (US 2002/0036820) and Arbore et al. (US 6,456,424) also teach ring OPOs.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (571) 272-1944. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



James Menefee
February 23, 2005
JM